

Preliminary Dosimetric Evaluation of Two New ^{153}Sm Bone Pain Palliative Agents

Authors : H. Yousefnia, S. Zolghadri, N. Amraee, Z. Naseri, Ar. Jalilian

Abstract : The purpose of this study was to calculate the absorbed dose to each human organ for two new Sm-153 bone-seeking agents in order to evaluate their effectiveness in bone pain palliation therapy. In this work, the absorbed dose of ^{153}Sm -TTHMP and ^{153}Sm -PDTMP to each human organ was evaluated based on biodistribution studies in rats by radiation dose assessment resource (RADAR) method. The highest absorbed dose for ^{153}Sm -TTHMP and ^{153}Sm -PDTMP is observed in trabecular bone with 1.844 and 3.167 mGy/MBq, respectively. Bone/red marrow dose ratio, as the target/critical organ dose ratio, for ^{153}Sm -PDTMP is greater than ^{153}Sm -TTHMP and is compatible with ^{153}Sm -EDTMP. The results showed that these bone-seeking agents, specially ^{153}Sm -PDTMP, have considerable characteristics compared to the most clinically used bone pain palliative radiopharmaceutical, and therefore, can be good candidates for bone pain palliation in patients with bone metastasis; however, further biological studies in other mammals are still needed.

Keywords : internal dosimetry, PDTMP, ^{153}Sm , TTHMP

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